

Nebraska Seat Belt Use Survey 2020 Data Collection Methodology Report

November 5, 2020

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Nebraska Seat Belt Use Survey

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Introduction

In an effort to achieve greater consistency and comparability in state-wide seat belt use reporting, the National Highway Traffic Safety Administration (NHTSA) issued new requirements in 2011 for observing and reporting future seat belt use. The requirements include the involvement of a qualified statistician in the sampling of specific road segments to be observed and in the data weighting process. A variety of specified operational details are also required. Each state prepares a plan that is approved by NHTSA and collects seat belt use data annually based on their approved plan. Every five years, the sample of road segments must be redrawn based upon updated information and approved by NHTSA.

In 2020, the Center for Survey Statistics & Methodology (CSSM) at Iowa State University was contracted to collaborate with the Bureau of Sociological Research (BOSR) at the University of Nebraska – Lincoln to provide statistical weighting for this year’s data collection. CSSM has prepared the Iowa Seat Belt Use Plan and conducted observations for the State of Iowa since 2012. Because of its experience, CSSM prepared materials, conducted training, tabulated data, and prepared deliverable files for the Nebraska project in 2019. BOSR provided staffing for conducting and supervising the data collection process in 2019 and in 2020. In 2020, BOSR created all forms and scheduling independently. CSSM’s role in the 2020 study was confined to processing and providing statistical analysis of raw data gathered and shared by BOSR and then using those data to prepare final datasets, tables, and this report.

Primary contacts at each organization are listed below.

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This report describes the data collection process for obtaining 2020 Nebraska seat belt use data as stipulated by the approved study design. It also includes tables with overall results showing seat belt use in Nebraska.

Preparation

The Nebraska DOT provided CSSM with available materials from past seat belt data collection processes. This included Nebraska’s original Seat Belt Use Survey Design from 2012, Note on Seat Belt Use Survey Reselection for 2017, the Nebraska Safety Belt Use 2018 Report, and a list of 72 sampled road segments. In 2019 CSSM planned and prepared materials for Nebraska’s data collection in accordance with the Nebraska 2012 & 2017 plans approved by the National Highway Traffic Safety Administration. Preparation involved several components: verifying the usability of the sampled sites, preparing general and site-specific materials for Data Collectors, and notifying appropriate local personnel prior to data collection. For data collection in 2020, BOSR independently prepared materials and notified local personnel according the previous year’s protocol.

Site Verification.

The Nebraska Seat Belt Survey Plan uses a sample of 72 road segments or sites spread across 9 counties. Douglas County (Omaha) has 18 sampled segments while Lancaster (Lincoln) has 12. The remaining 7 counties each have 6 sampled road segments. In 2019, a CSSM Project Manager examined the 72 sites for accessibility, safety, and practicality using Google Earth and other online sources. CSSM also checked the Nebraska Department of Transportation website to look for scheduled construction that could impact traffic patterns. BOSR oversaw these activities for 2020 Data Collection utilizing the same protocol.

Materials Preparation.

BOSR staff used online maps and Google Earth as prepared by CSSM in 2019 to identify and recommend observation points that would be safe and still provide the visibility necessary to observe seat belt use. BOSR staff prepared maps for Data Collectors to use as references when traveling to and locating sites. Equipment was prepared for use of Data Collectors including safety vests, signs, stop watches, and clickers. Data collection forms were printed. Data collection schedules were prepared for each site and administrative procedures were documented.

Notification.

Prior to BOSR carrying out their data collection, the Highway Safety Office Administrator notified city and county law enforcement agencies and the state patrol to ensure that appropriate officials in each site area would be aware of the project's purpose and dates and times of planned data collection. The administrator worked with the traffic engineering department to secure a letter for data collectors to present to law enforcement if questioned during the data collection period. NDOT worked with local divisions to ensure personnel were notified.

Data Collection Staff Training

BOSR employed five primary data collectors and two secondary data collectors in 2020. Primary data collectors were responsible for between 17 and 39 sites each. Secondary data collectors were assigned eight and six sites respectively. Quality Control functions were carried out by one BOSR staff member.

BOSR conducted a single-day project training which was held remotely through a Zoom meeting on August 4, 2020. (See the agenda in Figure 1.) The training session covered data collection protocols including: how to find the observation sites; choosing an observation location; how to properly collect data; defining seat belt "use," "nonuse," and "use unknown"; what to do if data cannot be collected at a site due to road construction, weather, or other circumstances; and the appropriate management and submission of collected data. Because of the ongoing COVID-19 pandemic at the time, COVID-19 safety training and protocols were also included in the 2020 project training. Roadside safety training was also provided, though, due to COVID-19, the project training did not include field exercises.

Responsibilities of Quality Control (QC) monitors were also reviewed at the training. QC duties include conducting unannounced site visits to a minimum of two sites for each Data Collector (10% of the total sites) and reviewing the Data Collector's field protocol. The QC Monitor met with the Data Collectors in the field to answer questions and to offer assistance as needed.

Data Collectors were instructed as to the use of their provided materials. Data Collectors were instructed to wear their bright yellow safety vests during data collection, for instance, and to use their car's flashing lights and a light to place on top of their vehicles as needed for safety. They were also instructed in the use of their clicker counters. They were instructed to use personal phones and stop watches for timekeeping. Data Collectors were provided with and

instructed in the use of “Survey Crew Ahead” signs for high speed areas and sites that did not afford adequate sidewalk or pedestrian space.

Observation Protocols and Procedures

All passenger vehicles, including commercial vehicles weighing less than 10,000 pounds, were eligible for observation. Data Collectors completed two forms in the field, the Observation Site Form and the Observation Tally Form, which are shown in Appendices A and B. The Observation Site Form documented descriptive information about each site. Data Collectors recorded information including observation date, site location and number, alternative site data, traffic directions and lanes available and observed, start and end times for observations, and weather conditions. They were also encouraged to include notes on best parking locations, best observation locations, and any other unique situations or issues that arose.

The Observation Tally Form was used to mark seat belt use/non-use/unknown use for drivers and right front passengers. Using the Observation Tally Form, seat belt use observations were made of all passenger vehicle drivers and right front seat occupants in the selected lane(s). The only right front seat occupants excluded from the study were child passengers traveling in child seats with harness straps. If there was no passenger in the right front seat of an observed vehicle, that information was also noted on the Observation Tally Form.

Figure 1. Seat Belt Data Collectors 2020 Training Agenda Tuesday, August 4, 2020

- Seat Belt Survey Overview
 - Study Design
 - NHTSA Requirements
 - Data Collection Requirements
 - Definitions of terms
- Data Collection Procedures
 - Assignments & Rescheduling
- Site Locations
 - Low/High volume roadways
 - Locating assigned sites
 - Site assignment sheets & maps
 - Discussing how to do correct observations
- Data Collection
 - Data Collection & Observation forms
 - Recording observations
 - Recording alternate site information
 - Traffic Counts
- Safety Training (NDOT representative)
 - Signage and visibility
 - Roadway safety
 - Setting up road work signs
- Quality Control and QC monitoring
- COVID-19 Safety Training and Protocols

Seat Belt use categories - Data Collectors recorded belt use for the driver and right front seat passenger using the definitions shown in Figure 2 below, which were provided in the federal regulations for this study.

Figure 2.

Code	Meaning	Definition
Y	Yes, belted	The shoulder belt is in front of the person’s shoulder.
N	No, unbelted	The shoulder belt is not in front of the person’s shoulder.
U	Unknown	It cannot reasonably be determined whether the driver or right front passenger is belted.
NP	No passenger	There is no right front passenger present.

Scheduling.

Data collectors were generally assigned in groups of two with each group recording observations across six sites in one county per work day. One group of data collectors would observe first, then a second pair would go to the next site, while the first group would prepare for the next site until all six sites were completed in the county. Some sites called for both groups of two to observe at the same time to ensure a large collection of observations could be obtained. Two counties utilized just one data collector due to low traffic volume. BOSR assigned the days of the week and data collector for each group of 6 sites. Observations were to start at the assigned times, as much as possible, and to continue for exactly 45 minutes.

Observations.

Data Collector groups were instructed to observe one lane per person and one direction of travel per observation site. If there were two groups observing at the same site, each group was instructed to observe one direction per group. The direction of travel was randomly assigned, though Data Collectors were allowed to observe the other direction as safety concerns or windshield glare dictated. Deviations from the randomly assigned direction were noted on the Observation Site Form. In a few cases, traffic on the assigned segment was so minimal that both directions of travel were observed. If an assigned road segment included an intersection, Data Collectors were instructed to observe traffic traveling on the assigned road segment, not the cross-street.

Lower volume roadways, such as county roads and streets, were observed from a field drive or other location where Data Collectors could safely move their vehicles from the roadway. In some situations, data collectors observed from their vehicle, while, in most cases, observing from outside of the vehicle was more effective.

Whenever possible, observations for high-volume, limited access roadways were made from an overpass. Observing from an overpass allowed for comparatively easy viewing of seat belt use for both the driver and the passenger. Gravel road overpasses were preferred because of the low traffic volume, reducing safety hazards to the data collector. In some instances, observing from an overpass required moving the observation point from the specific road segment by a couple of miles; however, because of the limited exit and entrance to these roadways, there were no significant changes to the observed vehicles between the assigned road segment and the observation point.

If a low volume overpass was not available, Data Collectors were allowed to observe traffic at an exit ramp or rest stop. In these cases, because the exit ramp/rest stop samples only a portion of the traffic passing on the main highway, an additional traffic volume count was required in order to adjust for reduced traffic. Only one rest stop exit ramp was used in 2020. The Data Collector completed a 45-minute observation period at an exit ramp. This traffic count information was recorded on the Observation Site Form and was used to adjust the seat belt usage observation data.

Alternate Sites.

If unexpected construction or difficulty in locating a useable and safe place to observe required the Data Collector to deviate further than 2 miles (or more than one block within a city) from the selected road segment, the Data Collector was instructed to call the office before proceeding and to note the location as an alternate site on the Observation Site form. For the 2020 data collection, no unanticipated alternate sites were needed.

Rescheduling.

If an assigned road segment was temporarily unavailable due to a traffic accident or inclement weather, data collection was to be rescheduled to the following week on the same day and at the same time. No rescheduling was needed during 2020 data collection, however.

Results

Data collection for 2020 occurred from Monday, August 10 through Friday, August 21, 2020. The 2020 seat belt use data collection resulted in the observation of **24,014 passenger vehicles**, with a right front seat passenger in 6,010 of those vehicles, for a total of **30,024 potential observations** of belt use. Of these 30,024 potential observations, there were 19,754 drivers and 5,010 right front passengers who were observed to be wearing seat belts (total 24,764 seat belt users). Seat belts were not worn by 3,877 drivers and 938 right front passengers (total 4,815 unbelted). Data collectors were unable to observe the seat belt use of 383 drivers and 62 passengers (total 445 unknown use).

The **unknown use, or “nonresponse rate,”** is **.0148 or 1.48%**. This is well within the range allowed by federal regulations, which require the nonresponse rate to be below 10%.

Federal regulations require a minimum of 7,500 observations, and the 2020 total of 24,014 passenger vehicles with 30,024 observed occupants exceeds the minimum requirement.

Quality control checks were completed with each of the five primary Data Collectors to ensure compliance with project protocols. Three Data Collectors were observed by a QC monitor at three sites, and two Data Collectors were observed at two sites. In total, quality control checks were conducted at 18% of the sites (13 out of 72), exceeding the federal regulation that a minimum of 5% of sites be subjected to such checks.

Federal regulations require the calculation of seat belt use to be conducted with weighted data as described in the approved survey plan. Data weighting was completed by Dr. Emily Berg, Assistant Professor of Statistics at Iowa State University.

Based upon the weighted data, **Nebraska's overall seat belt use rate for 2020 is 80.6%**, with an **estimated standard error of .022 or 2.2%**. This meets NHTSA's requirement that the standard error should be less than .025.

The 2020 weighted safety belt use rate is approximately 0.9 percentage points higher than 2019. Appendix C contains a description of the weighting process and standard error calculations and begins on page 17 of this report.

Tables and Appendices

Table 1 shows state-wide weighted Nebraska Safety Belt Use, excluding unknown cases, for 2020.

Table 2 lists the 72 observation sites with selected characteristics and the number of belted drivers and right front passengers for each site. This data is unweighted.

Tables 3 and 4 show the seat belt use of drivers and passengers by county. Table 3 contains the number or count of each category of belt use by drivers, passengers, and total for each sampled county. Table 4 contains two types of unweighted percentages of belt use for drivers, passengers, and combined total for each county. The “% of Total Belted” is the percent of the total number of persons (both drivers and passengers) who were belted. The “% of Known Belted” removes the persons with unknown belt use from the base number, so it becomes the percent of persons with known seat belt status who were belted. Note that these percentages are unweighted and the state-wide seat belt use percentage is slightly different than the weighted seat belt use percentage required by federal regulations for reporting. Nevertheless, the unweighted percentages in Table 4 enable legitimate comparisons between seat belt users/nonusers and between counties.

Tables 5 and 6 show the seat belt use of drivers and passengers by road type. Table 4 contains the number in each category and Table 5 contains unweighted percentages. Federal regulations required the new survey plan to classify road types as primary (including interstates), secondary, and local.

Table 7 contains seat belt use of drivers and passengers by day of the week. The percentages included in the table are unweighted.

Table 8 contains seat belt use of drivers and passengers by time of day. The percentages included in the table are unweighted.

Table 9 contains sample weights for each observation site as well as seat belt use for drivers and passengers (number or count). This information is used for Part B reporting purposes. It is also provided in an Excel file accompanying this report.

Appendix A. Observation Site Form

Appendix B. Observation Count Form

Appendix C. Estimation and Variance Estimation for the Nebraska 2020 Seat-Belt-Use Survey

Table 1. 2020 Nebraska Safety Belt Use, weighted and excluding “unknown” cases

Sample Division	N	2020 Belted Estimate		
		(S.E. in Parentheses)	95% CI Lower	95% CI Upper
Total Sample	29579	0.806 (0.022)	0.762	0.849
Drivers	23631	0.805 (0.024)	0.759	0.851
Passengers	5948	0.809 (0.018)	0.774	0.845

Table 2. 2020 Seat Belt Usage

Site #	County	Road Name	Road Type	Day	Start Time	Vehicle Count	Drivers Belted	Passenger Count	Passenger Belted
1001	Buffalo	US Hwy 183	Secondary	Fri	8:30 AM	27	20	8	7
1002	Buffalo	US Hwy 183	Secondary	Fri	9:46 AM	5	3	0	0
1003	Buffalo	I- 80	Primary	Fri	11:12 AM	852	733	430	374
1004	Buffalo	E 25th St	Secondary	Fri	1:31 PM	527	339	113	78
1005	Buffalo	I- 80	Primary	Fri	2:44 PM	419	281	503	445
1006	Buffalo	State Hwy 10	Secondary	Fri	3:45 PM	166	115	32	24
2001	Cheyenne	US Hwy 385	Secondary	Thurs	8:00 AM	77	54	13	11
2002	Cheyenne	I- 80	Primary	Thurs	9:34 AM	176	145	106	85
2003	Cheyenne	US Hwy 30	Secondary	Thurs	10:34 AM	51	30	66	61
2004	Cheyenne	Upland Pkwy	Secondary	Thurs	11:45 AM	291	224	77	58
2005	Cheyenne	I- 80	Primary	Thurs	2:00 PM	303	263	157	127
2006	Cheyenne	I- 80	Primary	Thurs	3:10 PM	266	229	118	103
3001	Dodge	US Hwy 275	Secondary	Wed	9:15 AM	192	151	49	41
3002	Dodge	US Hwy 275	Secondary	Wed	10:15 AM	185	150	34	27
3003	Dodge	US Hwy 275	Secondary	Wed	11:15 AM	195	157	55	42
3004	Dodge	State Hwy 91	Secondary	Wed	12:15 PM	80	49	18	14
3005	Dodge	State Hwy 79	Secondary	Wed	2:00 PM	44	36	11	10
3006	Dodge	N Broad St	Secondary	Wed	3:35 PM	400	321	76	63
4001	Douglas	NHWS Cleveland Blvd	Local	Tues	10:00 AM	11	8	0	0
4002	Douglas	Blair High Rd	Secondary	Tues	11:05 AM	710	576	85	73
4003	Douglas	Blair High Rd	Secondary	Tues	12:05 PM	900	736	132	112
4004	Douglas	N 79th St	Local	Tues	1:00 PM	3	2	0	0
4005	Douglas	Caldwell St	Local	Tues	3:00 PM	6	4	2	1
4006	Douglas	N 12th St	Local	Tues	4:10 PM	75	60	9	7
4007	Douglas	240th St	Secondary	Thurs	10:30 AM	272	227	28	25
4008	Douglas	S 234th St	Local	Thurs	11:35 AM	8	6	3	3
4009	Douglas	Adams St	Local	Thurs	12:50 PM	12	9	0	0
4010	Douglas	S 156th Avenue Cir	Local	Thurs	2:45 PM	15	13	0	0

Site #	County	Road Name	Road Type	Day	Start Time	Vehicle Count	Drivers Belted	Passenger Count	Passenger Belted
4011	Douglas	S 118th St	Local	Thurs	3:50 PM	58	54	8	8
4012	Douglas	I- 680	Primary	Thurs	4:55 PM	4024	3362	671	580
4013	Douglas	I- 80	Primary	Wed	9:12 AM	1710	1407	268	209
4014	Douglas	Arbor St	Local	Wed	10:25 AM	11	10	2	0
4015	Douglas	S 4th St	Local	Wed	11:30 AM	5	4	1	1
4016	Douglas	I- 480	Primary	Wed	1:17 PM	2208	1784	343	262
4017	Douglas	S 67th St	Local	Wed	2:25 PM	281	233	53	48
4018	Douglas	S 89th Ct	Local	Wed	3:17 PM	4	2	0	0
5001	Holt	US Hwy 20	Secondary	Sat	7:45 AM	44	31	7	6
5002	Holt	US Hwy 20	Secondary	Sat	9:00 AM	115	83	25	20
5003	Holt	US Hwy 20	Secondary	Sat	10:10 AM	105	72	27	22
5004	Holt	US Hwy 20	Secondary	Sat	11:10 AM	182	128	47	33
5005	Holt	State Hwy L-45B	Secondary	Sat	1:15 PM	11	6	1	0
5006	Holt	State Hwy L-45B	Secondary	Sat	2:15 PM	18	8	3	2
6001	Lancaster	W Wittstruck Rd	Local	Mon	7:35 AM	0	0	0	0
6002	Lancaster	SW 100th St	Local	Mon	8:40 AM	3	1	0	0
6003	Lancaster	SW 100th St	Local	Mon	10:00 AM	14	10	6	2
6004	Lancaster	S 12th St	Secondary	Mon	11:20 AM	360	284	91	67
6005	Lancaster	S 35th St	Local	Mon	1:20 PM	6	5	0	0
6006	Lancaster	Aspen Canyon Rd	Local	Mon	2:30 PM	10	8	1	1
6007	Lancaster	NW 48th St	Local	Mon	7:00 AM	264	231	47	45
6008	Lancaster	W Harvest Dr	Local	Mon	8:05 AM	42	34	7	6
6009	Lancaster	I- 80	Primary	Mon	9:10 AM	1111	944	325	278
6010	Lancaster	I- 80	Primary	Mon	10:30 AM	966	813	316	276
6011	Lancaster	David Dr	Local	Mon	12:20 PM	6	2	1	0
6012	Lancaster	O St	Secondary	Mon	1:35 PM	1272	1032	264	198
7001	Otoe	N 58th Rd	Secondary	Sun	10:45 AM	270	225	134	111
7002	Otoe	J Sterling Morton Btwy	Secondary	Sun	11:55 AM	175	137	92	75
7003	Otoe	S 48th Rd	Secondary	Sun	1:40 PM	21	17	8	6
7004	Otoe	Spr 66F	Secondary	Sun	3:00 PM	10	5	3	2
7005	Otoe	S 30th Rd	Secondary	Sun	4:10 PM	80	56	33	24
7006	Otoe	State Hwy 2	Secondary	Sun	5:10 PM	226	180	102	80
8001	Sarpy	I- 80	Primary	Fri	10:50 AM	1707	1529	613	532
8002	Sarpy	Shamrock Rd	Local	Fri	12:00 PM	7	6	1	1
8003	Sarpy	State Hwy 370	Secondary	Fri	1:55 PM	1066	931	128	103
8004	Sarpy	Barksdale Dr	Local	Fri	3:10 PM	20	19	4	4
8005	Sarpy	Eagle Crest Dr	Local	Fri	4:15 PM	44	40	3	3
8006	Sarpy	S 93rd St	Local	Fri	5:15 PM	12	10	0	0
9001	Seward	I- 80	Primary	Tues	10:30 AM	346	314	135	116
9002	Seward	5th St	Secondary	Tues	11:50 AM	140	92	17	9
9003	Seward	I- 80	Primary	Tues	1:48 PM	239	214	34	33
9004	Seward	McKelvie Rd/Hwy 34	Secondary	Tues	2:50 PM	346	307	41	35
9005	Seward	Alvo Rd/Hwy 34	Secondary	Tues	3:45 PM	0	0	0	0
9006	Seward	154th	Secondary	Tues	4:50 PM	207	183	23	21
Totals						24014	19754	6010	5010

Table 3. 2020 Driver and Passenger Seat Belt Use by County (n)

County	Drivers				Right Front Passengers				TOTAL			
	Total	Belted	Not Belted	Un-known	Total	Belted	Not Belted	Un-known	Total	Belted	Not Belted	Un-known
Buffalo	1996	1491	471	34	1086	928	149	9	3082	2419	620	43
Cheyenne	1164	945	209	10	537	445	83	9	1701	1390	292	19
Dodge	1096	864	194	38	243	197	42	4	1339	1061	236	42
Douglas	10313	8497	1656	160	1605	1329	269	7	11918	9826	1925	167
Holt	475	328	146	1	110	83	27	0	585	411	173	1
Lancaster	4054	3364	641	49	1058	873	174	11	5112	4237	815	60
Otoe	782	620	121	41	372	298	65	9	1154	918	186	50
Sarpy	2856	2535	284	37	749	643	94	12	3605	3178	378	49
Seward	1278	1110	155	13	250	214	35	1	1528	1324	190	14
Total	24014	19754	3877	383	6010	5010	938	62	30024	24764	4815	445

Table 4. 2020 Driver and Passenger Seat Belt Use by County (unweighted percentages)

County	Drivers		Right Front Passengers		TOTAL	
	% of Total Belted	% of Known Belted	% of Total Belted	% of Known Belted	% of Total Belted	% of Known Belted
Buffalo	74.7%	76.0%	85.5%	86.2%	78.5%	79.6%
Cheyenne	81.2%	81.9%	82.9%	84.3%	81.7%	82.6%
Dodge	78.8%	81.7%	81.1%	82.4%	79.2%	81.8%
Douglas	82.4%	83.7%	82.8%	83.2%	82.4%	83.6%
Holt	76.1%	76.3%	75.5%	75.5%	76.0%	76.1%
Lancaster	83.0%	84.0%	82.5%	83.4%	82.9%	83.9%
Otoe	79.3%	83.7%	80.1%	82.1%	79.5%	83.2%
Sarpy	88.8%	89.9%	85.8%	87.2%	88.2%	89.4%
Seward	86.9%	87.7%	85.6%	85.9%	86.6%	87.5%
Total	82.4%	83.7%	83.4%	84.2%	82.6%	83.8%

Table 5. 2020 Seat Belt Use by Road Type (n)

Road Type	Drivers				Right Front Passengers				Total			
	Total	Belted	Not Belted	Un-known	Total	Belted	Not Belted	Un-known	Total	Belted	Not Belted	Un-known
Local	917	771	134	12	148	130	16	2	1065	901	150	14
Primary	14327	12018	2116	193	4019	3420	565	34	18346	15438	2681	227
Secondary	8770	6965	1627	178	1843	1460	357	26	10613	8425	1984	204
TOTAL	24014	19754	3877	383	6010	5010	938	62	30024	24764	4815	445

Table 6. 2020 Seat Belt Use by Road Type (unweighted percentages)

Road Type	Drivers		Right Front Passengers		Total	
	% of Total Belted	% of Known Belted	% of Total Belted	% of Known Belted	% of Total Belted	% of Known Belted
Local	84.1%	85.2%	87.8%	89.0%	84.6%	85.7%
Primary	83.9%	85.0%	85.1%	85.8%	84.1%	85.2%
Secondary	79.4%	81.1%	79.2%	80.4%	79.4%	80.9%
TOTAL	82.3%	83.6%	83.4%	84.2%	82.5%	83.7%

Table 7. 2020 Driver and Passenger Seat Belt Use by Day of Week (n & unweighted %)

	Drivers Belted	Total Drivers	Passengers Belted	Total Passengers	% Drivers Belted	% Passengers Belted
Sunday	620	782	193	228	79.28%	84.65%
Monday	3364	4054	871	1009	82.98%	86.32%
Tuesday	2496	2983	1323	1627	83.67%	81.32%
Wednesday	4304	5315	368	470	80.98%	78.30%
Thursday	4616	5553	726	859	83.13%	84.52%
Friday	4026	4852	1084	1280	82.98%	84.69%
Saturday	328	475	445	537	69.05%	82.87%
TOTAL	19754	24014	5010	6010	82.26%	83.36%

Table 8. 2020 Driver and Passenger Seat Belt Use by Time of Day (n & unweighted %)

TOTAL	Drivers Belted	Total Drivers	Passengers Belted	Total Passengers	% Drivers Belted	% Passengers Belted
7AM to 759AM	241	279	47	49	86.53%	95.92%
8AM to 859AM	122	168	28	30	72.67%	93.70%
9AM to 959AM	2678	3242	599	731	82.60%	81.94%
10AM to 1059AM	1645	1955	556	650	84.13%	85.54%
11AM to 1159AM	3768	4472	1266	1496	84.26%	84.63%
12PM to 1259PM	1173	1500	246	310	78.20%	79.35%
1PM to 159PM	2685	3378	443	573	79.48%	77.31%
2PM to 259PM	2320	2809	582	721	82.59%	80.72%
3PM to 359PM	967	1207	477	548	80.12%	87.04%
4PM to 459PM	830	1024	154	185	81.05%	83.24%
5PM to 559PM	3325	3980	612	717	83.54%	85.36%
Total	19754	24014	5010	6010	82.26%	83.36%

Table 9. Sample Weights and Seat Belt Use by Observation Site: Part B Reporting Data (n)

Site ID	Site Type	Date Observed	Sample Weight	Number of Drivers	Number of Front Passengers	Number of Occupants Belted	Number of Occupants Unbelted	Number of Occupants Unknown Belt Use
1001	Original	8/21/2020	239.75	27	8	27	8	0
1002	Original	8/21/2020	142.28	5	0	3	2	0
1003	Original	8/21/2020	328.25	852	430	1107	165	10
1004	Original	8/21/2020	3586.29	527	113	417	211	12
1005	Original	8/21/2020	93.59	419	503	726	175	21
1006	Original	8/21/2020	668.18	166	32	139	59	0
2001	Original	8/20/2020	625.85	77	13	65	25	0
2002	Original	8/20/2020	262.80	176	106	230	44	8
2003	Original	8/20/2020	257.85	51	66	91	25	1
2004	Original	8/20/2020	564.32	291	77	282	85	1
2005	Original	8/20/2020	96.58	303	157	390	65	5
2006	Original	8/20/2020	193.88	266	118	332	48	4
3001	Original	8/12/2020	114.90	192	49	192	40	9
3002	Original	8/12/2020	259.65	185	34	177	34	8
3003	Original	8/12/2020	125.84	195	55	199	42	9
3004	Original	8/12/2020	362.35	80	18	63	34	1
3005	Original	8/12/2020	272.65	44	11	46	8	1
3006	Original	8/12/2020	9203.27	400	76	384	78	14
4001	Original	8/18/2020	5338.03	11	0	8	3	0
4002	Original	8/18/2020	126.73	710	85	649	130	16
4003	Original	8/18/2020	1021.36	900	132	848	164	20
4004	Original	8/18/2020	1964.77	3	0	2	1	0
4005	Original	8/18/2020	3823.52	6	2	5	3	0
4006	Original	8/18/2020	4458.09	75	9	67	16	1
4007	Original	8/13/2020	151.69	272	28	252	48	0
4008	Original	8/13/2020	2673.83	8	3	9	2	0
4009	Original	8/13/2020	3360.20	12	0	9	3	0
4010	Original	8/13/2020	3912.05	15	0	13	2	0
4011	Original	8/13/2020	1273.98	58	8	62	4	0
4012	Original	8/13/2020	49.62	4024	671	3942	734	19
4013	Original	8/12/2020	36.54	1710	268	1616	326	36
4014	Original	8/12/2020	3851.98	11	2	10	3	0
4015	Original	8/12/2020	6085.11	5	1	5	1	0
4016	Original	8/12/2020	91.44	2208	343	2046	438	67
4017	Original	8/12/2020	2874.84	281	53	281	45	8
4018	Original	8/12/2020	6286.02	4	0	2	2	0
5001	Original	8/15/2020	331.52	44	7	37	14	0
5002	Original	8/15/2020	1153.91	115	25	103	37	0
5003	Original	8/15/2020	992.05	105	27	94	38	0
5004	Original	8/15/2020	4404.28	182	47	161	67	1
5005	Original	8/15/2020	657.34	11	1	6	6	0

Site ID	Site Type	Date Observed	Sample Weight	Number of Drivers	Number of Front Passengers	Number of Occupants Belted	Number of Occupants Unbelted	Number of Occupants Unknown Belt Use
5006	Original	8/15/2020	1125.66	18	3	10	11	0
6001	Original	8/10/2020	347.38	0	0	0	0	0
6002	Original	8/10/2020	1351.46	3	0	1	2	0
6003	Original	8/10/2020	990.03	14	6	12	4	4
6004	Original	8/10/2020	112.54	360	91	351	88	12
6005	Original	8/10/2020	2741.66	6	0	5	1	0
6006	Original	8/10/2020	1712.99	10	1	9	2	0
6007	Original	8/17/2020	635.67	264	47	276	34	1
6008	Original	8/17/2020	7003.57	42	7	40	9	0
6009	Original	8/17/2020	111.82	1111	325	1222	205	9
6010	Original	8/17/2020	29.61	966	316	1089	173	20
6011	Original	8/17/2020	3330.00	6	1	2	5	0
6012	Original	8/17/2020	1389.84	1272	264	1230	292	14
7001	Original	8/16/2020	350.91	270	134	336	49	19
7002	Original	8/16/2020	464.98	175	92	212	44	11
7003	Original	8/16/2020	498.94	21	8	23	6	0
7004	Original	8/16/2020	1337.52	10	3	7	5	1
7005	Original	8/16/2020	1490.64	80	33	80	24	9
7006	Original	8/16/2020	228.47	226	102	260	58	10
8001	Original	8/14/2020	516.06	1707	613	2061	237	22
8002	Original	8/14/2020	3159.76	7	1	7	1	0
8003	Original	8/14/2020	493.68	1066	128	1034	133	27
8004	Original	8/14/2020	1607.22	20	4	23	1	0
8005	Original	8/14/2020	4850.46	44	3	43	4	0
8006	Original	8/14/2020	3979.45	12	0	10	2	0
9001	Original	8/18/2020	291.85	346	135	430	48	3
9002	Original	8/18/2020	648.51	140	17	101	54	2
9003	Original	8/18/2020	411.86	239	34	247	23	3
9004	Original	8/18/2020	124.84	346	41	342	40	5
9005	Original	8/18/2020	127.20	0	0	0	0	0
9006	Original	8/18/2020	626.68	207	23	204	25	1
TOTALS				24014	6010	24764	4815	445

Nebraska Seat Belt Survey

Site Form

Data Collector: _____

Date: ____ / ____ / 2019

Site Identification:

County: «County»	ID:
Road Name: «Road_name911»	County Site #: «County_map_inset_»

Site Start and End Time:

Start time for observations: _____ am/pm
End time for observations: _____ am/pm
(Total observation period MUST last exactly 45 minutes)

Site Description:

Selected traffic flow direction: North South East West
Total number of lanes in selected direction: _____
Weather Conditions: Clear Cloudy/PC Light Fog Light Rain

Alternate Site Information:

Is this an alternate site (not including a recommended observation point)?	No	Yes
If yes, why was an alternate site needed? _____		

Traffic Count:

Is a traffic count required (exit ramp or rest stop)?	No	Yes
If yes, Number of Cars: _____ Duration: _____		

Appendix B. Observation Count Form 2020

Nebraska Seat Belt Survey – Observation Count Form

County: _____

Page ___ of ___

County site #: _____

ID #: _____

Data Collector ID# _____

Responses: Y = Yes, N = No, U = Unknown, NP = No Passenger

VEHICLE NUMBER	DRIVER SEATBELT USE			PASSENGER SEATBELT USE			
	Y	N	U	Y	N	U	NP
1	Y	N	U	Y	N	U	NP
2	Y	N	U	Y	N	U	NP
3	Y	N	U	Y	N	U	NP
4	Y	N	U	Y	N	U	NP
5	Y	N	U	Y	N	U	NP
6	Y	N	U	Y	N	U	NP
7	Y	N	U	Y	N	U	NP
8	Y	N	U	Y	N	U	NP
9	Y	N	U	Y	N	U	NP
10	Y	N	U	Y	N	U	NP
11	Y	N	U	Y	N	U	NP
12	Y	N	U	Y	N	U	NP
13	Y	N	U	Y	N	U	NP
14	Y	N	U	Y	N	U	NP
15	Y	N	U	Y	N	U	NP
16	Y	N	U	Y	N	U	NP
17	Y	N	U	Y	N	U	NP
18	Y	N	U	Y	N	U	NP
19	Y	N	U	Y	N	U	NP
20	Y	N	U	Y	N	U	NP
21	Y	N	U	Y	N	U	NP
22	Y	N	U	Y	N	U	NP
23	Y	N	U	Y	N	U	NP
24	Y	N	U	Y	N	U	NP
25	Y	N	U	Y	N	U	NP
26	Y	N	U	Y	N	U	NP
27	Y	N	U	Y	N	U	NP
28	Y	N	U	Y	N	U	NP
29	Y	N	U	Y	N	U	NP
30	Y	N	U	Y	N	U	NP
31	Y	N	U	Y	N	U	NP
32	Y	N	U	Y	N	U	NP
33	Y	N	U	Y	N	U	NP
34	Y	N	U	Y	N	U	NP
35	Y	N	U	Y	N	U	NP
36	Y	N	U	Y	N	U	NP
37	Y	N	U	Y	N	U	NP
38	Y	N	U	Y	N	U	NP
39	Y	N	U	Y	N	U	NP
40	Y	N	U	Y	N	U	NP

VEHICLE NUMBER	DRIVER SEATBELT USE			PASSENGER SEATBELT USE			
	Y	N	U	Y	N	U	NP
41	Y	N	U	Y	N	U	NP
42	Y	N	U	Y	N	U	NP
43	Y	N	U	Y	N	U	NP
44	Y	N	U	Y	N	U	NP
45	Y	N	U	Y	N	U	NP
46	Y	N	U	Y	N	U	NP
47	Y	N	U	Y	N	U	NP
48	Y	N	U	Y	N	U	NP
49	Y	N	U	Y	N	U	NP
50	Y	N	U	Y	N	U	NP
51	Y	N	U	Y	N	U	NP
52	Y	N	U	Y	N	U	NP
53	Y	N	U	Y	N	U	NP
54	Y	N	U	Y	N	U	NP
55	Y	N	U	Y	N	U	NP
56	Y	N	U	Y	N	U	NP
57	Y	N	U	Y	N	U	NP
58	Y	N	U	Y	N	U	NP
59	Y	N	U	Y	N	U	NP
60	Y	N	U	Y	N	U	NP
61	Y	N	U	Y	N	U	NP
62	Y	N	U	Y	N	U	NP
63	Y	N	U	Y	N	U	NP
64	Y	N	U	Y	N	U	NP
65	Y	N	U	Y	N	U	NP
66	Y	N	U	Y	N	U	NP
67	Y	N	U	Y	N	U	NP
68	Y	N	U	Y	N	U	NP
69	Y	N	U	Y	N	U	NP
70	Y	N	U	Y	N	U	NP
71	Y	N	U	Y	N	U	NP
72	Y	N	U	Y	N	U	NP
73	Y	N	U	Y	N	U	NP
74	Y	N	U	Y	N	U	NP
75	Y	N	U	Y	N	U	NP
76	Y	N	U	Y	N	U	NP
77	Y	N	U	Y	N	U	NP
78	Y	N	U	Y	N	U	NP
79	Y	N	U	Y	N	U	NP
80	Y	N	U	Y	N	U	NP

Appendix C. Estimation and Variance Estimation for the Nebraska 2020 Seat-Belt-Use Survey

This section summarizes estimation and variance estimation procedures for the 2020 seat belt survey in Nebraska. The main result is that the estimated seat belt use rate for 2020 is consistent with results reported in 2019; in 2019, total seat belt use was reported to be 79.7% with a standard error of 2.3%, while the rate was 80.6% in 2020 with a standard error of 2.2%. These relatively consistent values indicate that the methodology used for sampling roadways and collecting and recording observations was consistent between 2019 and 2020.

The 2019 counterpart to this report contains a detailed summary of the roadway sample design for 2017-2022 surveys. The procedure for computing estimates and standard error for 2020 follows below.

Weights for Seat Belt Use Rates

The following procedures were used to compute the estimates and standard errors for seat belt use observation data for the state of Nebraska in 2020.

The weight is π_{ij}^{-1} , where π_{ij} is the probability of selecting road segment j in county i . The probability is the unconditional probability (not the conditional probability of selecting a road segment given that the county was selected). Inclusion probabilities calculated for the 2019 study were carried over into the study design for 2020. This procedure is explained in the 2019 counterpart to this report.

Variance Estimation

A variance estimator is used to estimate conditional variance and is utilized in this study to adjust for the oversampling of observations in Douglas and Lancaster counties. The procedure used for the 2020 survey differs from the 2019 procedure. The 2020 variance estimator is the with-replacement variance of the linearized estimator of the proportion.

Let $i = 1, \dots, 7$ index the counties other than Lancaster or Douglas. Let $i = 8$ denote Douglas County and $i = 9$ denote Lancaster County. Introduce a further sub-script of h for the road type, where $h = 1, 2, 3$ for road types of local, primary, and secondary, respectively. Let π_i be the probability that county i is selected, where $\pi_i = 1$ for Douglas or Lancaster county. Let v index the variable of interest, where $v = p$ for passengers, $v = t$ for total occupants, and $v = d$ for drivers. Let $y_{ijh,v}$ and $z_{ijh,v}$, respectively, be the belted and unbelted counts for road segment j with road type h of county i for variable v . Let $x_{ijh,v} = y_{ijh,v} + z_{ijh,v}$. For $i = 1, \dots, 7$, define

$$r_{i,s} = \frac{7}{\pi_i} \sum_{h=1}^3 \sum_{j=1}^{n_{hi}} \pi_{j|i}^{-1} \hat{t}_{x,s}^{-1} (y_{ijh,s} - \hat{\theta}_s x_{ijh,s}),$$

where $\hat{t}_{x,s} = \sum_{i=1}^9 \sum_{j=1}^{n_i} \pi_{ij}^{-1} x_{ij,s}$, $\hat{t}_{y,s} = \sum_{i=1}^{15} \sum_{j=1}^{n_i} \pi_{ij}^{-1} y_{ij,s}$, $\hat{\theta}_s = \hat{t}_{y,s} \hat{t}_{x,s}^{-1}$, and $\pi_{j|i} = \pi_i^{-1} \pi_{ij}$. For $i = 8, 9$, let

$$r_{ijh,s} = \frac{n_{ih}}{\pi_{ij}} \hat{t}_{x,s}^{-1} (y_{ijh,s} - \hat{\theta}_s x_{ijh,s}).$$

The estimate of the variance is

$$\hat{V} = \hat{V}_1 + \hat{V}_2,$$

where

$$\hat{V}_1 = \frac{1}{7(6)} \sum_{i=1}^7 (r_{i,s} - \bar{r}_s)^2,$$

$$\hat{V}_2 = \sum_{i=8}^9 \sum_{h=1}^3 s_{ih}^2 / n_{ih},$$

$$s_{ih}^2 = (n_{ih} - 1)^{-1} \sum_{j=1}^{n_{ih}} (r_{ijh,s} - r_{i,h,s})^2, r_{i,h,s} = n_{ih}^{-1} \sum_{j=1}^{n_{ih}} r_{ijh,s}, \text{ and } \bar{r}_s = \sum_{i=1}^7 r_{i,s}.$$